General

Guideline Title

Hip fracture. The management of hip fracture in adults.

Bibliographic Source(s)

National Clinical Guideline Centre. Hip fracture. The management of hip fracture in adults. London (UK): National Institute for Health and Clinical Excellence (NICE); 2011 Jun. 27 p. (Clinical guideline; no. 124).

Guideline Status

This is the current release of the guideline.

Regulatory Alert

FDA Warning/Regulatory Alert

Note from the National Guideline Clearinghouse: This guideline references a drug(s) for which important revised regulatory and/or warning information has been released.

- March 22, 2016 – Opioid pain medicines : The U.S. Food and Drug Administration (FDA) is warning about several safety issues with the entire class of opioid pain medicines. These safety risks are potentially harmful interactions with numerous other medications, problems with the adrenal glands, and decreased sex hormone levels. They are requiring changes to the labels of all opioid drugs to warn about these risks.

Recommendations

Major Recommendations

Note from the National Guideline Clearinghouse (NGC): This guideline was developed by the National Clinical Guideline Centre (NCGC) on behalf of the National Institute for Health and Clinical Excellence (NICE). See the "Availability of Companion Documents" field for the full version of this guidance.

Imaging Options in Occult Hip Fracture

Offer magnetic resonance imaging (MRI) if hip fracture is suspected despite negative anteroposterior pelvis and lateral hip X-rays. If MRI is not

available within 24 hours or is contraindicated, consider computed tomography (CT).

Timing of surgery

Perform surgery on the day of, or the day after, admission.

Identify and treat correctable comorbidities immediately so that surgery is not delayed by:

- Anaemia
- Anticoagulation
- Volume depletion
- Electrolyte imbalance
- Uncontrolled diabetes
- Uncontrolled heart failure
- Correctable cardiac arrhythmia or ischaemia
- Acute chest infection
- Exacerbation of chronic chest conditions

Analgesia

Assess the patient's pain:

- Immediately upon presentation at hospital and
- Within 30 minutes of administering initial analgesia and
- Hourly until settled on the ward and
- Regularly as part of routine nursing observations throughout admission

Offer immediate analgesia to patients presenting at hospital with suspected hip fracture, including people with cognitive impairment.

Ensure analgesia is sufficient to allow movements necessary for investigations (as indicated by the ability to tolerate passive external rotation of the leg), and for nursing care and rehabilitation.

Offer paracetamol every 6 hours preoperatively unless contraindicated.

Offer additional opioids if paracetamol alone does not provide sufficient preoperative pain relief.

Consider adding nerve blocks if paracetamol and opioids do not provide sufficient preoperative pain relief, or to limit opioid dosage. Nerve blocks should be administered by trained personnel. Do not use nerve blocks as a substitute for early surgery.

Offer paracetamol every 6 hours postoperatively unless contraindicated.

Offer additional opioids if paracetamol alone does not provide sufficient postoperative pain relief.

Non-steroidal anti-inflammatory drugs (NSAIDs) are not recommended.

Anaesthesia

Offer patients a choice of spinal or general anaesthesia after discussing the risks and benefits.

Consider intraoperative nerve blocks for all patients undergoing surgery.

Planning the Theatre Team

Schedule hip fracture surgery on a planned trauma list.

Consultants or senior staff should supervise trainee and junior members of the anaesthesia, surgical, and theatre teams when they carry out hip fracture procedures.

Surgical Procedures

Operate on patients with the aim to allow them to fully weight bear (without restriction) in the immediate postoperative period.

Perform replacement arthroplasty (hemiarthroplasty or total hip replacement) in patients with a displaced intracapsular fracture.

Offer total hip replacements to patients with a displaced intracapsular fracture who:

- Were able to walk independently out of doors with no more than the use of a stick and
- Are not cognitively impaired and
- Are medically fit for anaesthesia and the procedure

Use a proven femoral stem design rather than Austin Moore or Thompson stems for arthroplasties. Suitable designs include those with an Orthopaedic Data Evaluation Panel rating of 10A, 10B, 10C, 7A, 7B, 5A, 5B, 3A, or 3B.

Use cemented implants in patients undergoing surgery with arthroplasty.

Consider an anterolateral approach in favour of a posterior approach when inserting a hemiarthroplasty.

Use extramedullary implants such as a sliding hip screw in preference to an intramedullary nail in patients with trochanteric fractures above and including the lesser trochanter (Arbeitsgemeinschaft für Osteosynthesefragen [AO] classification types A1 and A2).

Use an intramedullary nail to treat patients with a subtrochanteric fracture.

Mobilisation Strategies

Offer patients a physiotherapy assessment and, unless medically or surgically contraindicated, mobilisation on the day after surgery.

Offer patients mobilisation at least once a day and ensure regular physiotherapy review.

Multidisciplinary Management

From admission, offer patients a formal, acute, orthogeriatric, or orthopaedic ward-based Hip Fracture Programme that includes all of the following:

- Orthogeriatric assessment
- Rapid optimisation of fitness for surgery
- Early identification of individual goals for multidisciplinary rehabilitation to recover mobility and independence, and to facilitate return to pre-fracture residence and long-term wellbeing
- Continued, coordinated, orthogeriatric, and multidisciplinary review
- Liaison or integration with related services, particularly mental health, falls prevention, bone health, primary care, and social services
- Clinical and service governance responsibility for all stages of the pathway of care and rehabilitation, including those delivered in the community

If a hip fracture complicates or precipitates a terminal illness, the multidisciplinary team should still consider the role of surgery as part of a palliative care approach that:

- Minimises pain and other symptoms and
- Establishes patients' own priorities for rehabilitation and
- Considers patients' wishes about their end-of-life care

Healthcare professionals should deliver care that minimises the patient's risk of delirium and maximises their independence, by:

- Actively looking for cognitive impairment when patients first present with hip fracture
- Reassessing patients to identify delirium that may arise during their admission
- Offering individualised care in line with the NICE guideline Delirium: diagnosis, prevention and management (NICE clinical guideline 103).

Consider early supported discharge as part of the Hip Fracture Programme, provided the Hip Fracture Programme multidisciplinary team remains involved, and the patient:

- Is medically stable and
- Has the mental ability to participate in continued rehabilitation and
- Is able to transfer and mobilise short distances and
- Has not yet achieved their full rehabilitation potential, as discussed with the patient, carer, and family

Only consider intermediate care (continued rehabilitation in a community hospital or residential care unit) if all of the following criteria are met:

- Intermediate care is included in the Hip Fracture Programme and
- The Hip Fracture Programme team retains the clinical lead, including patient selection, agreement of length of stay, and ongoing objectives for intermediate care and
- The Hip Fracture Programme team retains the managerial lead, ensuring that intermediate care is not resourced as a substitute for an effective acute hospital Programme.

Patients admitted from care or nursing homes should not be excluded from rehabilitation programmes in the community or hospital, or as part of an early supported discharge programme.

Patient and Carer Information

Offer patients (or, as appropriate, their carer and/or family) verbal and printed information about treatment and care including:

- Diagnosis
- Choice of anaesthesia
- Choice of analgesia and other medications
- Surgical procedures
- Possible complications
- Postoperative care
- Rehabilitation programme
- Long-term outcomes
- Healthcare professionals involved

Clinical Algorithm(s)

The following clinical algorithms for hip fracture are provided in the quick reference guide (see the "Availability of Companion Documents" field):

- Analgesia
- Surgery

Scope

Disease/Condition(s)

Hip fracture

Guideline Category

Counseling

Diagnosis

Evaluation

Management

Rehabilitation

Treatment

Clinical Specialty

Anesthesiology

Critical Care

Emergency Medicine

Family Practice

Geriatrics

Internal Medicine

Orthopedic Surgery

Radiology

Surgery

Intended Users

Advanced Practice Nurses

Allied Health Personnel

Health Care Providers

Nurses

Patients

Physician Assistants

Physicians

Public Health Departments

Guideline Objective(s)

To provide guidance on the emergency, preoperative, operative, and postoperative management of hip fracture, including rehabilitation, in adults

Target Population

- Adults aged 18 years and older presenting to the health service with a clinical diagnosis (firm or provisional) of fragility fracture of the hip
- People with the following types of hip fracture:
  - Intracapsular (undisplaced and displaced)
  - Extracapsular (trochanteric and subtrochanteric)
- Those with comorbidity strongly predictive of outcome, and those without such comorbidity

Note: These guidelines are not intended for use in the following patients:

People younger than 18 years
People with fractures caused by specific pathologies other than osteoporosis or osteopaenia

Interventions and Practices Considered

Assessment/Evaluation

1. Magnetic resonance imaging
2. Computed tomography
3. X-ray
4. Pain assessment

Management/Treatment

1. Surgery
    - Timing of surgery
    - Identification and correction of comorbidities prior to surgery
2. Analgesia
    - Paracetamol (acetaminophen)
    - Opioids
    - Nerve block
3. Anaesthesia
    - Spinal
    - General
    - Intraoperative nerve block
4. Planning of theatre team
    - Scheduling operation on trauma list
    - Supervision of junior members of team
5. Surgical procedures
    - Aiming to allow patients to fully weight bear (without restriction) in the immediate postoperative period
    - Arthroplasty (hemiarthroplasty or total hip replacement), as indicated
    - Use of proven femoral stem design
    - Cemented implants in patients undergoing surgery with arthroplasty
    - Anterolateral approach for insertion of a hemiarthroplasty
    - Extramedullary implants such as a sliding hip screw in preference to an intramedullary nail (in patients with trochanteric fractures above and including the lesser trochanter)
    - Intramedullary nail (for patients with a subtrochanteric fracture)
6. Mobilisation strategies
    - Physiotherapy assessment and mobilisation on the day after surgery (as indicated)
    - Mobilisation at least once a day
    - Regular physiotherapy review
7. Multidisciplinary management
    - Hip Fracture Programme
    - Intermediate care
    - Early supported discharge programme
8. Provision of information to patients, carers and/or family

Major Outcomes Considered

- Sensitivity, specificity, positive and negative predictive values, and positive and negative likelihood ratios of imaging diagnostics
- Requirement for surgical revision
- Mortality
- Length of stay in secondary care
- Length of time before community resettlement/discharge
- Length of stay in hospital/acute care
- Discharge destination
- Hospital readmission
- Place of residence (compared with baseline) 12 months after fracture
- Functional status
- Quality of life
- Pain
- Adverse effects of analgesia/anaesthesia
- Complications of treatments
- Mobility
- Cost-effectiveness (quality-adjusted life years)

Methodology

Methods Used to Collect/Select the Evidence

Searches of Electronic Databases

Description of Methods Used to Collect/Select the Evidence

Note from the National Guideline Clearinghouse (NGC): This guideline was developed by the National Clinical Guideline Centre (NCGC) on behalf of the National Institute for Health and Clinical Excellence (NICE). See the "Availability of Companion Documents" field for the full version of this guidance.

Searching for Evidence

Clinical Literature Search

Systematic literature searches were undertaken to identify evidence within published literature in order to answer the review questions as per the NICE Guidelines Manual 2009. Clinical databases were searched using relevant medical subject headings, free-text terms, and study type filters where appropriate. Studies published in languages other than English were not reviewed. Where possible, searches were restricted to articles published in English language. All searches were conducted on core databases, MEDLINE, EMBASE, and The Cochrane Library. Additional subject specific databases were used for some questions: PsycINFO for patient views and patient education questions; CINAHL for every question except those on anaesthesia, analgesia, and the surgical procedures. All searches were updated on the 31st August 2010. No papers after this date were considered.

Search strategies were checked by looking at reference lists of relevant key papers, checking search strategies in other systematic reviews and asking the Guideline Development Group (GDG) for known studies. The questions, the study types applied, the databases searched, and the years covered can be found in Appendix D of the full version of the original guideline document.

During the scoping stage, a search was conducted for guidelines and reports on the websites listed below and on organisations relevant to the topic. Searching for grey literature or unpublished literature was not undertaken. All references sent by stakeholders were considered.

- Guidelines International Network database (www.g-i-n.net)
- National Guideline Clearinghouse (www.guideline.gov/)
- National Institute for Health and Clinical Excellence (NICE) (www.nice.org.uk)
- National Institutes of Health Consensus Development Program (consensus.nih.gov/)
- National Health Service (NHS) Evidence (www.evidence.nhs.uk/)

Evidence of Effectiveness

The Research Fellow:

- Identified potentially relevant studies for each review question from the relevant search results by reviewing titles and abstracts – full papers were then obtained.
- Reviewed full papers against pre-specified inclusion/exclusion criteria to identify studies that addressed the review question in the appropriate population and reported on outcomes of interest (review protocols are included in Appendix C of the full version of the original guideline document).

Inclusion/Exclusion

See the review protocols in Appendix C of the full version of the original guideline document for full details.

Health Economic Literature Search

Systematic literature searches were also undertaken to identify health economic evidence within published literature relevant to the review questions. The evidence was identified by conducting a broad search relating to the guideline population in the NHS Economic Evaluation Database (NHS EED) and Health Technology Assessment (HTA) database with no date restrictions. Additionally, the search was run on MEDLINE and EMBASE, with a specific economic filter, to ensure recent publications that had not yet been indexed by these databases were

identified. This was supplemented by additional searches that looked for economic papers specifically relating to the radiological imaging question on MEDLINE, EMBASE, NHS EED and HTA databases, and the Health Economic Evaluations Database (HEED) as it became apparent that some papers in this area were not being identified through the first search. Studies published in languages other than English were not reviewed. Where possible, searches were restricted to articles published in English language.

The search strategies for health economics are included in Appendix D of the full version of the original guideline document. All searches were updated on the 31st August 2010. No papers published after this date were considered.

The Health Economist:

- Identified potentially relevant studies for each review question from the economic search results by reviewing titles and abstracts – full papers were then obtained.
- Reviewed full papers against pre-specified inclusion/exclusion criteria to identify relevant studies (see below for details).
- Critically appraised relevant studies using the economic evaluations checklist as specified in the NICE Guidelines Manual 2009.

Inclusion/Exclusion

Full economic evaluations (cost-effectiveness, cost-utility, cost-benefit, and cost-consequence analyses) and comparative costing studies that addressed the review question in the relevant population were considered potentially applicable as economic evidence.

Studies that only reported cost per hospital (not per patient), or only reported average cost-effectiveness without disaggregated costs and effects, were excluded. However, studies reporting the cost per hospital were included when it was possible to ascertain the cost per patient of each intervention. Abstracts, posters, reviews, letters/editorials, foreign language publications, and unpublished studies were excluded. Studies judged to have had an applicability rating of 'not applicable' were excluded (this included studies that took the perspective of a non-Organisation for Economic Co-operation and Development [OECD] country).

Remaining studies were prioritised for inclusion based on their relative applicability to the development of this guideline and the study limitations. For example, if a high quality, directly applicable UK analysis was available other less relevant studies may not have been included. Where exclusions occurred on this basis, this is noted in the relevant section in the full version of the original guideline document.

For more details about the assessment of applicability and methodological quality see the economic evaluation checklist (Appendix H of the NICE Guidelines Manual 2009 and the health economics research protocol in Appendix C of the full version of the original guideline document).

When no relevant economic analysis was found from the economic literature review, relevant UK NHS unit costs related to the compared interventions were presented to the GDG to inform the possible economic implication of the recommendation to make.

Undertaking a New Health Economic Analysis

As well as reviewing the published economic literature for each review question, as described above, new economic analyses were undertaken by the Health Economist in priority areas. Additional data for the analysis was identified as required through additional literature searches undertaken by the Health Economist, and discussion with the GDG.

Number of Source Documents

Not stated

Methods Used to Assess the Quality and Strength of the Evidence

Weighting According to a Rating Scheme (Scheme Given)

Rating Scheme for the Strength of the Evidence

Overall Quality of Outcome Evidence in Grading of Recommendations Assessment, Development and Evaluation

Level	Description
High	Further research is very unlikely to change confidence in the estimate of effect

Level	Description
Moderate	Further research is likely to have an important impact on confidence in the estimate of effect and may change the estimate
Low	Very likely to have an important impact on confidence in the estimate of effect and is likely to change the estimate
Very low	Any estimate of effect is very uncertain

Methods Used to Analyze the Evidence

Meta-Analysis

Review of Published Meta-Analyses

Systematic Review with Evidence Tables

Description of the Methods Used to Analyze the Evidence

Note from the National Guideline Clearinghouse (NGC): This guideline was developed by the National Clinical Guideline Centre (NCGC) on behalf of the National Institute for Health and Clinical Excellence (NICE). See the "Availability of Companion Documents" field for the full version of this guidance.

Evidence of Effectiveness

The Research Fellow:

- Critically appraised relevant studies using the appropriate checklist as specified in the Guidelines Manual 2009.
- Extracted key information about the study's methods and results into evidence tables (evidence tables are included in Appendix E of the full version of the original guideline document).
- Generated summaries of the evidence by outcome (included in the relevant chapter write-ups):
    - Randomised studies: meta analysed, where appropriate and reported in Grading of Recommendations Assessment, Development and Evaluation (GRADE) profiles (for clinical studies) – see below for details
    - Observational studies: data presented as a range of values in GRADE profiles
    - Diagnostic studies: data presented as a range of values in adapted GRADE profiles
    - Qualitative studies: each study summarised in a table where possible, otherwise presented in a narrative

Methods of Combining Clinical Studies

Data Synthesis for Intervention Reviews

Where possible, meta-analyses were conducted to combine the results of studies for each review question using Cochrane Review Manager (RevMan5) software. Fixed-effects (Mantel-Haenszel) techniques were selected to calculate risk ratios (relative risk) for the binary outcomes. The continuous outcomes were analysed using an inverse variance method for pooling weighted mean differences and where the studies had different scales, standardised mean differences were used.

Statistical heterogeneity was assessed by considering the chi-squared test for significance at $p<0.05$ or an I-squared inconsistency statistic of >50% to indicate significant heterogeneity. Where significant heterogeneity was present, a predefined subgroup analyses was carried out as defined in the protocol for each question (see Appendix C in the full version of the original guideline document). Sensitivity analysis based on the quality of studies was also carried out if there were differences, with particular attention paid to allocation concealment, blinding and loss to follow-up (missing data).

Assessments of potential differences in effect between subgroups were based on the chi-squared tests for heterogeneity statistics between subgroups. If no sensitivity analysis was found to completely resolve statistical heterogeneity then a random effects (DerSimonian and Laird) model was employed to provide a more conservative estimate of the effect.

For binary outcomes, absolute event rates were also calculated using the GRADEpro software using event rate in the control arm of the pooled results.

Data Synthesis for Diagnostic Test Accuracy Review

For diagnostic test accuracy studies, the following outcomes were reported: sensitivity, specificity, positive predictive value, negative predictive value and positive and negative likelihood ratios. In cases where the outcomes were not reported, 2 by 2 tables were constructed from raw data to allow calculation of these accuracy measures. Summary receiver operative characteristic (ROC) curves were not generated as the guideline developers did not explore the effect of different cut-off thresholds on sensitivity and specificity for the imaging questions.

Appraising the Quality of Evidence by Outcomes

The evidence for outcomes from the included randomised controlled trial (RCT) and observational studies were evaluated and presented using an adaptation of the 'GRADE toolbox' developed by the international GRADE working group (http://www.gradeworkinggroup.org/). The software (GRADEpro) developed by the GRADE working group was used to assess the quality of each outcome, taking into account individual study quality and the meta-analysis results. See Section 3.3.3 of the full version of the original guideline document for further details.

Grading the Quality of Clinical Evidence

After results were pooled, the overall quality of evidence for each outcome was considered. The following procedure was adopted when using GRADE:

1. A quality rating was assigned, based on the study design. RCTs start HIGH and observational studies as LOW, uncontrolled case series as LOW or VERY LOW.
2. The rating was then downgraded for the specified criteria: Study limitations, inconsistency, indirectness, imprecision, and reporting bias. These criteria are detailed in Sections 3.3.5-3.3.8 of the full version of the original guideline document. Observational studies were upgraded if there was: a large magnitude of effect, dose-response gradient, and if all plausible confounding would reduce a demonstrated effect or suggest a spurious effect when results showed no effect. Each quality element considered to have 'serious' or 'very serious' risk of bias were rated down -1 or -2 points respectively.
3. The downgraded/upgraded marks were then summed and the overall quality rating was revised. For example, all RCTs started as HIGH and the overall quality became MODERATE, LOW, or VERY LOW if 1, 2, or 3 points were deducted respectively.
4. The reasons or criteria used for downgrading were specified in the footnotes.

Evidence of Cost-Effectiveness

The Health Economist:

- Extracted key information about the study's methods and results into evidence tables (evidence tables are included in Appendix F of the full version of the original guideline document).
- Generated summaries of the evidence in NICE economic evidence profiles – see "Descriptions of Methods Used to Analyze the Evidence" field for details.

National Institute for Health and Clinical Excellence (NICE) Economic Evidence Profiles

The NICE economic profile has been used to summarise cost and cost-effectiveness estimates. The economic evidence profile shows, for each economic study, an assessment of applicability and methodological quality, with footnotes indicating the reasons for the assessment. These assessments were made by the health economist using the economic evaluation checklist from the NICE Guidelines Manual 2009, Appendix H (see the "Availability of Companion Documents" field). It also shows incremental costs, incremental outcomes (e.g., quality-adjusted life years [QALYs]), and the incremental cost-effectiveness ratio from the primary analysis, as well as information about the assessment of uncertainty in the analysis. See Table 3-5 in the full version of the original guideline document for more detail.

If a non-UK study was included in the profile, the results were converted into pounds sterling using the appropriate purchasing power parity.

When no cost-effectiveness evidence was available, the cost of the interventions being evaluated has in some cases been determined by conducting original cost analyses there were reported in Appendix H of the full version of the original guideline document. Alternatively, the guideline development group (GDG) was presented with the cost figures from relevant sources, such as the National Health Service (NHS) reference cost for England and Wales.

Methods Used to Formulate the Recommendations

Expert Consensus

Description of Methods Used to Formulate the Recommendations

Note from the National Guideline Clearinghouse (NGC): This guideline was developed by the National Clinical Guideline Center (NCGC) on behalf of the National Institute for Health and Clinical Excellence (NICE). See the "Availability of Companion Documents" field for the full version of this guidance.

A multidisciplinary Guideline Development Group (GDG) comprising professional group members and consumer representatives of the main stakeholders developed this guideline. The GDG was convened by the NCGC in accordance with guidance from NICE.

The group met every 6-8 weeks during the development of the guideline.

Developing the Review Questions and Outcomes

Review questions were developed in a PICO framework (patient, intervention, comparison and outcome) for intervention reviews, and with a framework of population, index tests, reference standard and target condition for reviews of diagnostic test accuracy. This was to guide the literature searching process and to facilitate the development of recommendations by the guideline development group (GDG). They were drafted by the NCGC technical team and refined and validated by the GDG. The questions were based on the key clinical areas identified in the scope (see Appendix A in the full version of the original guideline). See the full version of the original guideline for further information on the outcome measures.

Developing Recommendations

Over the course of the guideline development process, the GDG was presented with:

- Evidence tables of the clinical evidence (see Appendix E of the full version of the original guideline document) and economic evidence (see Appendix F of the full version of the original guideline document) reviewed from the literature.
- Summary of clinical and economic evidence and quality (as presented in Chapters 5 to 13 in the full version of the original guideline document).
- Forest plots (see Appendix G of the full version of the original guideline document)
- A description of the methods and results of the cost-effectiveness analysis undertaken for the guideline (see Appendix H of the full version of the original guideline document)

Recommendations were drafted on the basis of the GDG interpretation of the available evidence, taking into account the balance of benefits, harms, and costs. When clinical and economic evidence was of poor quality, conflicting, or absent, the GDG drafted recommendations based on their expert opinion. The considerations for making consensus based recommendations include the balance between potential harms and benefits, economic or implications compared to the benefits, current practices, recommendations made in other relevant guidelines, patient preferences, and equality issues. The consensus recommendations were done through discussions in the GDG.

Rating Scheme for the Strength of the Recommendations

Not applicable

Cost Analysis

Undertaking New Health Economic Analysis

As well as reviewing the published economic literature for each review question, new economic analyses were undertaken by the Health Economist in priority areas. Priority areas for new health economic analysis were agreed by the Guideline Development Group (GDG) after formation of the review questions and consideration of the available health economic evidence. Model structure, inputs, and assumptions were explained to and agreed by the GDG members during meetings, and they commented on subsequent revisions.

See Appendix H of the full version of the original guideline document for details of the health economic analyses undertaken for the guideline.

Cost-Effectiveness Criteria

In general, an intervention was considered to be cost-effective if either of the following criteria applied (given that the estimate was considered plausible):

a. The intervention dominated other relevant strategies (that is, it was both less costly in terms of resource use and more clinically effective compared with all the other relevant alternative strategies), or
b. The intervention cost less than £20,000 per quality-adjusted life-year (QALY) gained compared with the next best strategy.

If the GDG recommended an intervention that was estimated to cost more than £20,000 per QALY gained, or did not recommend one that was estimated to cost less than £20,000 per QALY gained, the reasons for this decision are discussed explicitly in the 'from evidence to recommendations' section of the relevant chapter in the full version of the original guideline document. This is written with reference to the issues regarding the plausibility of the estimate or to the factors set out in the social value judgements report.

Method of Guideline Validation

External Peer Review

Internal Peer Review

Description of Method of Guideline Validation

Validation Process

The guidance is subject to an eight week public consultation and feedback as part of the quality assurance and peer review of the document. All comments received from registered stakeholders are responded to in turn and posted on the National Institute for Health and Clinical Excellence (NICE) website when the pre-publication check of the full guideline occurs.

Evidence Supporting the Recommendations

Type of Evidence Supporting the Recommendations

The type of evidence supporting the recommendations is not specifically stated.

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

Appropriate management of hip fracture in adults

Potential Harms

- Paracetamol (acetaminophen) should be avoided or used with caution in patients with known hypersensitivity to paracetamol and in liver and renal disease.
- Repeated use of opioids may cause dependence and tolerance. Elderly patients are more susceptible to the harmful effects of opioid analgesics. Many older patients may have impaired respiratory function and opioids should be used with caution in these patients.
- There is a small chance of nerve damage following regional anaesthesia.
- Local nerve blocks are associated with a very rare incidence of nerve damage, administering them in a busy casualty department may require a rolling programme of training junior doctors or nurses to be competent with this technique.
- A potential disadvantage of general anaesthesia is that recovery on the first postoperative day may be slower.
- Magnetic resonance imaging (MRI) has the potential to cause claustrophobia due to the need for patients to remain in a confined space for a considerable length of time.

See Sections 4-13 in the full version of the original guideline document (see the "Availability of Companion Documents" field) for a discussion of potential harms associated with recommendations.

Contraindications

Contraindications

Magnetic resonance imagining cannot be used in patients with certain types of metallic implants.

Qualifying Statements

Qualifying Statements

- This guidance represents the view of the National Institute of Health and Clinical Excellence (NICE), which was arrived at after careful consideration of the evidence available. Healthcare professionals are expected to take it fully into account when exercising their clinical judgement. However, the guidance does not override the individual responsibility of healthcare professionals to make decisions appropriate to the circumstances of the individual patient, in consultation with the patient and/or guardian or carer, and informed by the summary of product characteristics of any drugs they are considering.
- Implementation of this guidance is the responsibility of local commissioners and/or providers. Commissioners and providers are reminded that it is their responsibility to implement the guidance, in their local context, in light of their duties to avoid unlawful discrimination and to have regard to promoting equality of opportunity. Nothing in this guidance should be interpreted in a way that would be inconsistent with compliance with those duties.

Study Limitations

The Guideline Development Group (GDG) accepted that investigator blinding in surgical intervention studies was impossible and participant blinding was also impossible to achieve in most situations. Therefore, open-label studies for surgery were not downgraded in the quality rating across the guideline. Studies were downgraded for unclear or inadequate allocation concealment.

The main limitations for randomised controlled trials are listed in Table 3-4 of the full version of the original guideline.

Implementation of the Guideline

Description of Implementation Strategy

The National Institute for Clinical Excellence (NICE) has developed tools to help organisations implement this guidance (see www.nice.org.uk/guidance/CG124).

Key Priorities for Implementation

Timing of Surgery

- Perform surgery on the day of, or the day after, admission.
- Identify and treat correctable comorbidities immediately so that surgery is not delayed by:
    - Anaemia
    - Anticoagulation
    - Volume depletion
    - Electrolyte imbalance
    - Uncontrolled diabetes
    - Uncontrolled heart failure
    - Correctable cardiac arrhythmia or ischaemia
    - Acute chest infection
    - Exacerbation of chronic chest conditions

Planning the Theatre Team

- Schedule hip fracture surgery on a planned trauma list.

Surgical Procedures

- Perform replacement arthroplasty (hemiarthroplasty or total hip replacement) in patients with a displaced intracapsular fracture.
- Offer total hip replacements to patients with a displaced intracapsular fracture who:
  - Were able to walk independently out of doors with no more than the use of a stick and
  - Are not cognitively impaired and
  - Are medically fit for anaesthesia and the procedure
- Use extramedullary implants such as a sliding hip screw in preference to an intramedullary nail in patients with trochanteric fractures above and including the lesser trochanter (Arbeitsgemeinschaft für Osteosynthesefragen [AO] classification types A1 and A2).

Mobilisation Strategies

- Offer patients a physiotherapy assessment and, unless medically or surgically contraindicated, mobilisation on the day after surgery.
- Offer patients mobilisation at least once a day and ensure regular physiotherapy review.

Multidisciplinary Management

- From admission, offer patients a formal, acute orthogeriatric or orthopaedic ward-based Hip Fracture Programme that includes all of the following:
  - Orthogeriatric assessment
  - Rapid optimisation of fitness for surgery
  - Early identification of individual goals for multidisciplinary rehabilitation to recover mobility and independence, and to facilitate return to pre-fracture residence and long-term wellbeing
  - Continued, coordinated, orthogeriatric, and multidisciplinary review liaison or integration with related services, particularly mental health, falls prevention, bone health, primary care, and social services
  - Clinical and service governance responsibility for all stages of the pathway of care and rehabilitation, including those delivered in the community
- Consider early supported discharge as part of the Hip Fracture Programme, provided the Hip Fracture Programme multidisciplinary team remains involved, and the patient:
  - Is medically stable and
  - Has the mental ability to participate in continued rehabilitation and
  - Is able to transfer and mobilise short distances and
  - Has not yet achieved their full rehabilitation potential, as discussed with the patient, carer and family

Implementation Tools

Audit Criteria/Indicators

Clinical Algorithm

Foreign Language Translations

Patient Resources

Quick Reference Guides/Physician Guides

Resources

Slide Presentation

For information about availability, see the *Availability of Companion Documents* and *Patient Resources* fields below.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Getting Better

IOM Domain

Effectiveness

Patient-centeredness

Timeliness

Identifying Information and Availability

Bibliographic Source(s)

National Clinical Guideline Centre. Hip fracture. The management of hip fracture in adults. London (UK): National Institute for Health and Clinical Excellence (NICE); 2011 Jun. 27 p. (Clinical guideline; no. 124).

Adaptation

Not applicable: The guideline was not adapted from another source.

Date Released

2011 Jun

Guideline Developer(s)

National Clinical Guideline Centre - National Government Agency [Non-U.S.]

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National Institute for Health and Clinical Excellence (NICE)

Guideline Committee

Guideline Development Group

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Financial Disclosures/Conflicts of Interest

At the start of the guideline development process all Guideline Development Group (GDG) members declared interests including consultancies, fee-paid work, share-holdings, fellowships, and support from the healthcare industry. At all subsequent GDG meetings, members declared arising conflicts of interest, which were also recorded.

Members were either required to withdraw completely or for part of the discussion if their declared interest made it appropriate. The details of declared interests and the actions taken are shown in Appendix B of the full version of the original guideline document.

Guideline Status

This is the current release of the guideline.

Guideline Availability

Electronic copies: Available in Portable Document Format (PDF) from the National Institute for Health and Clinical Excellence (NICE) Web site .

Availability of Companion Documents

The following is available:

- Hip fracture. The management of hip fracture in adults. Quick reference guide. London (UK): National Institute for Health and Clinical Excellence (NICE); 2011 Jun. 12 p. (Clinical guideline; no. 124). Electronic copies: Available in Portable Document Format (PDF) from the National Institute for Health and Clinical Excellence (NICE) Web site .
- The management of hip fracture in adults. Full guideline. London (UK): National Institute for Health and Clinical Excellence (NICE); 2011 Jun. 664 p. (Clinical guideline; no. 124). Electronic copies: Available in PDF from the NICE Web site .
- Hip fracture. Costing report. London (UK): National Institute for Health and Clinical Excellence (NICE); 2011 Jun. 36 p. (Clinical guideline; no. 124). Electronic copies: Available in PDF from the NICE Web site .
- Hip fracture. Costing template. London (UK): National Institute for Health and Clinical Excellence (NICE); 2011 Jun. (Clinical guideline; no. 124). Electronic copies: Available from the NICE Web site .
- Hip fracture. Clinical audit tools. London (UK): National Institute for Health and Clinical Excellence (NICE); 2011 Jun. (Clinical guideline; no. 124). Electronic copies: Available from the NICE Web site .
- Hip fracture. Electronic audit tools. London (UK): National Institute for Health and Clinical Excellence (NICE); 2011 Jun. (Clinical guideline; no. 124). Electronic copies: Available from the NICE Web site .
- Hip fracture. Baseline assessment tool. London (UK): National Institute for Health and Clinical Excellence (NICE); 2011 Jun. (Clinical guideline; no. 124). Electronic copies: Available from the NICE Web site .
- Hip fracture. Slide set. London (UK): National Institute for Health and Clinical Excellence (NICE); 2011 Jun. 18 p. (Clinical guideline; no. 124). Electronic copies: Available from the NICE Web site .
- The management of hip fracture in adults. Implementation advice. National Institute for Health and Clinical Excellence (NICE); 2011 Jun. 48 p. (Clinical guideline; no. 124). Electronic copies: Available from the NICE Web site .
- The guidelines manual 2009. London (UK): National Institute for Health and Clinical Excellence (NICE); 2009 Jan. Electronic copies: Available in PDF from the NICE Archive Web site .

Patient Resources

The following is available:

- Hip fracture in adults. Understanding NICE guidance. Information for people who use NHS services. London: National Institute for Health and Clinical Excellence (NICE); 2011 Jun. 19 p. Electronic copies: Available from the National Institute for Health and Clinical Excellence (NICE) Web site. Also available in Welsh from the NICE Web site.

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NGC Status

This summary was completed by ECRI Institute on March 16, 2102. This summary was updated by ECRI Institute on October 28, 2013 following the U.S. Food and Drug Administration advisory on Acetaminophen. This summary was updated by ECRI Institute on June 2, 2016 following the U.S. Food and Drug Administration advisory on Opioid pain medicines.

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